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BOOK REVIEWS

Biologia Centrali-Americana. Archæology. Appendix: The Archaic Maya Inscriptions. By J. T. Goodman. 1897. Large 4to, pp. ix, 149; 111 pages of tables.

As this work is devoted to a discussion of the character and signification of the hieroglyphs of the Central American inscriptions, and of certain discoveries in regard thereto which the author claims to have made, it is to be expected that it will undergo a rigid examination. Before presenting any criticisms on the work, it is proper to state that Mr Goodman has beyond question made some important discoveries, which, together with those previously made, will form an important step in the efforts to solve the riddle of these inscriptions.

On page 12 of his work he takes for granted that he has discovered the signification of the series 13, 9, 5, 1, 10, 6, 2, 11, 7, 3, 8, 4, mentioned by Perez as given in an old manuscript as a "key to find the *katuns*." These he finds to be the numbers of the terminal days of the 360-day periods which he terms "*Ahaus*." It is true the numbers of the terminal or commencing days follow one another in this order counting forward, but fail in counting backward. Yet this author tells us that "all Maya dates relate to elapsed time." As they fail in counting backward, it is difficult to understand how they were used as a "key to find the *katuns*" of "time elapsed." Moreover, it is stated that these fall "on the days of the *uayeb haab*," whereas Mr Goodman omits the *uayeb haab* (the five added days) from his calculation in this connection, using only the 360-day period. As shown in my "Study of the Manuscript Troano," this series is found in counting backward the numbers of the years of one name—that is, the *Akbal* line of years, the *Lamat* line, etc, and will apply as well by using the last of the *uayeb* days as the initial days. Furthermore, it will serve to find the *katuns* (of years) whether we count them as 20-year periods or 24-year periods.

On page 14 it is asserted that the Maya years, "though always appearing to consist of only 365 days, are the exact equivalents of ours, leap years and all, throughout whatever period the reckoning may extend." As he admits that in Maya chronology "no allowance is to be made for bissextile days," his assumption is a guess without a basis.

On page 21 occurs the following passage :

"I now come to what has been a stumbling-block to every one who has hitherto attempted to deal with the Maya records. It has been known that the Mayas reckoned time by ahaus, katuns, cycles, and great cycles; but what was the precise length of any of these periods has been a debatable question. Some have contended, with the best of proof apparently, that the katun is a period of twenty years, while others have maintained, with proof equally good, that it is a period of twenty-four years. The truth is, it is neither.

"The contention arose from a misapprehension, or total ignorance, rather, of the Maya chronological scheme. It was taken for granted that a year of 365 days must necessarily enter into the reckoning; whereas, the moment the Mayas departed from scientific dates and embarked upon an extended time reckoning, they left their annual calendar behind and made use of a separate chronological one."

What he claims as his "Chronological Calendar" is in reality nothing more than the numerical scheme explained and illustrated by Förstemann and used by others.

His arrangement and names of periods are as follows :

- 1 Chuen = 20 days.
- 1 Ahau = 18 Chuens = 360 days.
- 1 Katun = 20 Ahaus = 7,200 days.
- 1 Cycle = 20 Katuns = 144,000 days.
- 1 Great Cycle = 13 Cycles.

This, with the exception of the last, is precisely the series found in the Dresden codex, and has been recognized for the last six or eight years. In the codex, however, the orders of units (for they are nothing more) are indicated by position instead of by characters, as in the inscriptions. They are placed one above another thus :

- 4..... great cycles.
- 5..... cycles.
- 19 katuns.
- 13..... ahaus.
- 12..... chuens.
- 8..... days—

Mr Goodman's names for the equivalent periods being placed opposite the respective orders. The lowest, or first order of units, indicates days. The next above is the second order, each unit of this order equaling 20 of the first; each unit of the third equals 18 of the second; ascending thence by multiples of twenty, precisely as in Mr Goodman's arrangement, except the last step,

where, without any evidence therefor, he makes the multiple 13, while Förstemann's multiple is 20. The series given here is not a hypothetical one, but one taken from Dr Förstemann's "Zur Entzifferung der Mayahandschriften," dated January 25, 1891, and is his explanation of a particular numeral series in the Dresden codex. The last statement of the paragraph quoted is incorrect.

Mr Goodman's chief and important discoveries are, that in the inscriptions these periods or orders of units are indicated by symbols instead of by position, as in the codices; and the identification of these symbols. The names given by him to the periods, except the days, are all arbitrary as to application, even his *Ahau* being used in a different sense from that of the earliest authorities. The names, however, are of little importance, unless found to be correct interpretations of the symbols, which is not claimed.

Mr Goodman's use of the day *Ahau* as the basis of his count and tables is arbitrary, as any one acquainted with the Maya calendar system knows, since any other day could be selected with the same result. Moreover, *Ahau* is never the beginning or ending of any regular time period, except the 13-day period, and is not once so given in Mr Goodman's long series of tables. A better basis would have been one of the dominical days or year-bearers.

As Mr Goodman, in tracing out any of the time series of the inscriptions which have dates has necessarily to reduce his chronological series into the regular calendar series, it is apparent that the former, after all he has said in regard to it, is simply the Maya method of numeration in counting time, and nothing more.

I pass over without comment his Grand Cycle, Grand Era, the supposed numeral value of the month and day symbols, as no evidence is offered to establish his theory in regard to these. The numbering of his Great Cycles does not appear, so far as his work shows, to be sustained by any real evidence. Nevertheless, it seems probable, though it is not proven, that the character to which he applies the name of the former is a time symbol.

Having made these criticisms, which the general tone of the paper seems to justify, I take pleasure in expressing the opinion that Mr Goodman has made a discovery which will greatly aid in solving the mystery of the Central American inscriptions, though it will be of but little assistance in the interpretation of the codices, as the equivalents are already known.

By the aid of Mr Goodman's key I have succeeded in tracing mathematically two of the series on the right slab of the Tablet of the Cross (No. 1), Palenque, and in identifying two characters hitherto undetermined. These are numbered according to Rau's scheme ("Palenque Tablet," p. 61) 14 S and 1 U, the first the symbol for the day 2 *Caban* and the second the symbol for the month *Ceh*.

To illustrate: Using Goodman's terms, we count forward (by my table 3, "Maya Year," p. 21) from 11 *Lamat* (10 S), 6 *Xul* (10 T), in the year 10 *Akbal*, 9 days, 3 *Chuens* (12 S), and 13 *Ahaus* (12 T) = 4,749 days, to 2 *Caban* (14 S), 10 *Xul* (14 T), in the year 10 *Lamat*. Counting forward from this date 3 days and 6 *Chuens* (15 S) = 123 days, we reach 8 *Ahau* (17 T), 13 *Ceh* (1 U), of the same year, 10 *Lamat*. His *katun* symbols are seen at 4 U, 14 V, 12 X, etc. It is apparent from these examples that a careful tracing of the series will serve to identify quite a number of characters hitherto undetermined.

CYRUS THOMAS.

Die Tagegötter der Mayas. By Dr E. Förstemann. Pt. I, *Globus*, vol. lxxiii, No. 9; Pt. II, *Globus*, vol. lxxiii, No. 10.

The names of heathen gods are readily recognized in the etymology of the English nomenclature of week days, and this evidence of a dedication of days to gods survives in all European languages. It appears from statements of early Spanish writers, as Nuñez de la Vega and others, that a like usage existed in Central America. The identity of the names of several days of the Maya calendar with those of gods has been indicated, but these identifications are limited in number, and but for the epoch-making work of Dr Schellhas, whose nomenclature and identification of the figures of Maya gods have given vitality to the study of Maya paleography, remained fragmentary knowledge. Aided, however, by the new light shed on the subject by Schellhas' work, Dr Förstemann, in the above-mentioned articles, considers the relationship of the "day gods" to the twenty days from *Kan* to *Akbal*.

These articles are among the most important contributions to the Maya calendar which have been published in late years, and, like all his previous work, merit careful study by Americanists.

J. WALTER FEWKES.